



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

2 Applicant: Raimer Tossavainen  
3 Series Code/Serial No.: 10/634981 Filed: 2003-08-05  
4 Group Art Unit: P.C. Paper No.: 2  
5 Invention: HYDROFOIL SYSTEM FOR LIFTING A BOAT PARTIALLY OUT OF WATER AN  
6 AMOUNT SUFFICIENT TO REDUCE DRAG  
7 Examiner: Agent's Doc. No.: TOSR18A

8 As article No.: EL586862321US EXPRESS MAIL I hereby certify, that on the  
9 below indicated date, this correspondence is being deposited with the  
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12 22313-1450.

13 MS Patent Application  
14 Commissioner for Patents  
15 P.O. BOX 1450  
16 ALEXANDRIA, VA 22313-1450

BY:   
Agent for Applicant

Date: March 08, 2004

17 PETITION TO MAKE SPECIAL UNDER 37 CFR 1.102 AND MPEP 708.02(VIII)

18 Petitioner hereby petitions that the above-identified patent  
19 application be made special, accordingly attached herewith is applicant's  
20 check number 5303 drawn on SOUND CREDIT UNION, in the amount of \$130.00 to  
21 cover the required petition fee, as required by MPEP 708.02(VIII)(A), and  
22 set forth in 37 CFR 1.17(h).

23 The above-identified patent application contains claims 1-22  
24 directed to a single invention of a HYDROFOIL SYSTEM FOR LIFTING A BOAT  
25 PARTIALLY OUT OF WATER AN AMOUNT SUFFICIENT TO REDUCE DRAG, as required by  
26 MPEP 708.02(VIII)(B).

27 A pre-examination search was made by a professional searcher. The  
28 field of search, as required by MPEP 708.02(VIII)(C), is accordingly  
29 submitted here with and is appropriately indicated in the following table:

Paper No.: 2  
S.N.: 10/634981  
Agt. Doc. No.: TOSR18A

-1-

1	<u>CLASS</u>	<u>ASSOCIATED SUBCLASS</u>
2	114	057, 274, 275, 277, 282, 286
3	441	064

4 Except for references which were already submitted with the  
5 application and are accordingly marked with an "\*" asterisk, one copy of  
6 each of the references deemed most closely related to the subject matter  
7 encompassed by the claims are submitted herewith, as required by MPEP  
8 708.02(VIII)(D), along with a supplemental INFORMATION DISCLOSURE  
9 CITATION Form PTO-1449 listing all of these said references.

10 A detailed discussion of the references, which discussion points  
11 out, with the particularly required by 37 CFR 1.111 (b) and (c), how the  
12 claimed subject matter is distinguishable over the references follows,  
13 as required by MPEP 708.02(VIII)(E).

14 The present invention teaches a hydrofoil system for lifting a  
15 boat out of water an amount sufficient to reduce drag while still  
16 allowing the boat to be powered by a conventional inboard-outboard  
17 drive. The hydrofoil system includes a front hydrofoil unit, a center  
18 hydrofoil unit, and a pair of rear hydrofoil units. The front hydrofoil  
19 unit includes a hydrofoil portion that dependingly mounts to a mounting  
20 portion thereof that depends from the bottom of the hull at the bow  
21 thereof. The center hydrofoil unit includes a hydrofoil that  
22 dependingly extends equidistantly outwardly from a pair of stanchions  
23 thereof that depend from the bottom of the hull at the substantial  
24 center thereof. Each rear hydrofoil unit includes a hydrofoil that  
25 dependingly extends equidistantly outwardly from a pair of stanchions  
26 thereof that depend from port and starboard trim tab units of the hull,  
27 respectively.

1        U.S. Patent No. 3,092,062 to Savitsky teaches in combination with  
2 a water borne vessel, a passive self-compensating hydrofoil control  
3 system comprising a substantially vertical hydrofoil strut member and a  
4 hydrofoil plane, said vertical strut member being connected at its upper  
5 end to the hull of said vessel, said hydrofoil plane being disposed at  
6 the lower end of said strut member and operable to maintain a  
7 hydrodynamic lift of the vessel to a minimum submergence of the  
8 hydrofoil plane below the free water surface at cruise speed of the  
9 vessel, each of said strut and plane members having integral pivotal  
10 flaps defining at least a portion of the trailing edges of said members,  
11 said pivotal flap of the strut member terminating at its lower end at a  
12 height above said hydrofoil plane which is greater than said minimum  
13 submergence, and mechanical linkage means interconnecting both of said  
14 pivotal flaps and operable, on application of unbalanced external forces  
15 to one flap causing it to pivot, to apply to the other flap a force  
16 acting to move said other flap toward a position for equalizing the  
17 forces applied to both flaps.

18        In contradistinction, however, the present invention teaches a  
19 hydrofoil system for lifting a boat out of water an amount sufficient to  
20 reduce drag while still allowing the boat to be powered by a  
21 conventional inboard-outboard drive. The hydrofoil system includes a  
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25 the bottom of the hull at the bow thereof. The center hydrofoil unit  
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27 from a pair of stanchions thereof that depend from the bottom of the  
28 hull at the substantial center thereof. Each rear hydrofoil unit  
29 includes a hydrofoil that dependingly extends equidistantly outwardly  
30 from a pair of stanchions thereof that depend from port and starboard  
31 trim tab units of the hull, respectively.

1       U.S. Patent No. 3,577,948 to Frey teaches an attachment for a  
2 power boat which fits on the transom or stern of the boat and comprises  
3 a pair of trim tabs hinged at the transom and extending rearwardly  
4 therefrom, and which may be swung vertically simultaneously to different  
5 angular positions to trim the boat so that it operates at the proper  
6 attitude regardless of its loading. The tabs are so formed that they  
7 also bring about lateral stability as well as impart the proper attitude  
8 to the boat. Furthermore, the tabs are positively moved vertically up  
9 or down to their selected angular positions.

10       In contradistinction, however, the present invention teaches a  
11 hydrofoil system for lifting a boat out of water an amount sufficient to  
12 reduce drag while still allowing the boat to be powered by a  
13 conventional inboard-outboard drive. The hydrofoil system includes a  
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15 hydrofoil units. The front hydrofoil unit includes a hydrofoil portion  
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17 the bottom of the hull at the bow thereof. The center hydrofoil unit  
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19 from a pair of stanchions thereof that depend from the bottom of the  
20 hull at the substantial center thereof. Each rear hydrofoil unit  
21 includes a hydrofoil that dependingly extends equidistantly outwardly  
22 from a pair of stanchions thereof that depend from port and starboard  
23 trim tab units of the hull, respectively.

24       U.S. Patent No. 3,651,775 to Kock teaches the present invention  
25 relates to a hydrofoil system attached to a hull of a vessel.  
26 The foil are attached to the hull of a vessel by means of non-lifting  
27 struts and each foil comprises a main lifting foil portion which  
28 consists of submerged middle section and two upwardly and outwardly  
29 inclined side section which control the end position of the lift. In a  
30 spaced relation and parallel to the inclined sections, two auxiliary

1 upper lifting foil portions are attached on each side of the hull for  
2 supporting the lifting action and stabilizing the vessel.

3 In contradistinction, however, the present invention teaches a  
4 hydrofoil system for lifting a boat out of water an amount sufficient to  
5 reduce drag while still allowing the boat to be powered by a  
6 conventional inboard-outboard drive. The hydrofoil system includes a  
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13 hull at the substantial center thereof. Each rear hydrofoil unit  
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15 from a pair of stanchions thereof that depend from port and starboard  
16 trim tab units of the hull, respectively.

17 U.S. Patent No. 4,756,265 to Lane teaches a thrust collar is  
18 disclosed for mounting around the upper portion of the propeller of an  
19 inboard/outboard engine. Each thrust collar supports a horizontal  
20 hydrofoil wing extending laterally from the collar. A second, similar  
21 wing can be provided on an opposing side of the collar. Where the  
22 collar is used in pairs on paired engines on a catamaran hull, a single  
23 hydrofoil wing can be supported between the thrust collars. The thrust  
24 collar is preferably used in conjunction with hull lifting structures.  
25 One hull mounted hydrofoil structure is supported at the lower end of  
26 the strut extending and includes a generally curvilinear gull-wing  
27 shaped lower surface. For V-type hulls, a pair of elongated mechanical  
28 lifting structures, symmetrically positioned on either side of the keel  
29 substantially in the vicinity of the keel are attached to the hull so as  
30 to extend generally transversely to the sloping side surfaces of the hull  
31 intersecting at the keel. These lifting structures have a length many

1 times greater than their maximum transverse dimension and preferably  
2 extend from a position approximately a midship beneath the hull to the  
3 stern of the hull. Retractable hydrofoil assemblies are described for  
4 drawing a strut supporting a hydrofoil wing into a boat or rotating the  
5 strut upward into a tunnel beneath the boat in the case of a catamaran  
6 hull.

7 In contradistinction, however, the present invention teaches a  
8 hydrofoil system for lifting a boat out of water an amount sufficient to  
9 reduce drag while still allowing the boat to be powered by a  
10 conventional inboard-outboard drive. The hydrofoil system includes a  
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17 hull at the substantial center thereof. Each rear hydrofoil unit  
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19 from a pair of stanchions thereof that depend from port and starboard  
20 trim tab units of the hull, respectively.

21 U.S. Patent No. 4,915,048 to Stanford teaches planing vessels of  
22 improved performance capability and methods for improving such  
23 performance and foils which may be associated with a planing vessels for  
24 providing improved performance capability. A dynamic downward force  
25 generated as the vessel moves through water, preferably by a foil, is  
26 imposed on the vessel, with the locus of the force positioned, in the  
27 traverse direction, at the longitudinal vertical centerline plane of the  
28 vessel. In the longitudinal direction the locus of the dynamic force is  
29 positioned, relative to the other forces acting fore-to-aft on the  
30 vessel, to decrease the trim angle of the vessel, desirably to less than  
31 two degrees. Vessel wetted surface configurations are provided for

1 stable and efficient operation at low trim angles, including the  
2 following. A deep draft, fine entrance which minimizes rise at the bow  
3 experienced with conventional planing vessels and assists in maintaining  
4 laminarity of flow at the planing surfaces. A foil extending along the  
5 bowpeak below the waterline and spaced forwardly thereof to streamline  
6 the flow passing the bow to thereby decrease spray and turbulence. A  
7 skeg extending downward at the bottom of the hull at the entrance along  
8 the longitudinal centerline plane which improves directional stability  
9 and also assists in maintaining flow laminarity. A swept back wing  
10 located at the entrance, preferably mounted at the lower margin of the  
11 skeg positioned with an angle of attack which generates an upward force  
12 to improve the vessel stability against pitch and yaw in disturbed  
13 water. An aftmidships planing floor having a rise from midships to the  
14 stern trailing edge desirably from 50% to 100% of the midships draft  
15 improves the stability of the vessel when operated at trim. A release  
16 floor extending aftward 5 to 25% of the waterline length of the vessel,  
17 preferably from a transverse step and rising over this length 10 to 50%  
18 of the midships draft to a transverse trailing edge. The trailing edge  
19 and the release floor, in the transverse direction, are parallel with  
20 base plane of the vessel. The pressure release floor reduces the  
21 pressure on the aftward flow to separation at the trailing edge in a  
22 gradual and uniform manner which reduces drag. The foil to generate a  
23 downward force in the flow desirably is positioned below the stern  
24 trailing edge and contoured to produce minimum induced drag and to  
25 divert the flow at its trailing edge downwardly so as to reduce  
26 turbulence and drag at the stern.

27 In contradistinction, however, the present invention teaches a  
28 hydrofoil system for lifting a boat out of water an amount sufficient to  
29 reduce drag while still allowing the boat to be powered by a  
30 conventional inboard-outboard drive. The hydrofoil system includes a  
31 front hydrofoil unit, a center hydrofoil unit, and a pair of rear

1 hydrofoil units. The front hydrofoil unit includes a hydrofoil portion  
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6 hull at the substantial center thereof. Each rear hydrofoil unit  
7 includes a hydrofoil that dependingly extends equidistantly outwardly  
8 from a pair of stanchions thereof that depend from port and starboard  
9 trim tab units of the hull, respectively.

10 U.S. Patent No. 5,404,830 to Ligozio teaches the invention is a  
11 displacement boat hull having the outboard surfaces of its wetted  
12 portion designed with a deep-V shape, and having at least one pair of  
13 retractable hydrofoil fins positioned in respective pockets along those  
14 outboard surfaces at a predetermined distance above the keel. When  
15 extended, the fins are positioned at fixed angles relative to the hull,  
16 and at least one pair of fins is positioned in proximity to the stern.  
17 In a preferred embodiment, a conventional deep-V semi-displacement hull  
18 is modified to increase the conventional maximum draft with an unusually  
19 steep angle (at least 30 degrees to 40 degrees) for the initial deadrise  
20 from the keel upward toward the chine; and at least two pairs of fins  
21 are disposed on opposite sides of the hull, with an aft pair being  
22 positioned in proximity to the stern and another pair being positioned  
23 forward of the stern pair, preferably just forward of the boat's center  
24 of balance. The fins are continuously adjustable from (a) a fully-  
25 retracted in-pocket position to a fully-extended position laterally  
26 outboard of the hull. The invention can be used to modify catamaran and  
27 tri-hulls as well as mono-hulls, and it is compatible with all types of  
28 propulsion systems. Such modifications provide a remarkably low center  
29 of gravity that assures excellent balance and stability at all times,  
30 particularly when operating with the fins, while achieving higher speeds  
31 and requiring less power.



1           In contradistinction, however, the present invention teaches a  
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13 from a pair of stanchions thereof that depend from port and starboard  
14 trim tab units of the hull, respectively.

15           U.S. Patent No. 6,146,224 to McCarthy teaches methods which are  
16 disclosed for increasing lift and decreasing drag on hydrofoils and swim  
17 fins. These methods include providing a hydrofoil with a highly swept  
18 back leading edge portion and orienting the hydrofoil at a significantly  
19 reduced angle of attack in which the reduced angle of attack occurs at  
20 an angle that is substantially transverse to the hydrofoil's direction  
21 of movement through a surrounding fluid medium. The lee surfaces of the  
22 hydrofoil is provided with a substantially unobstructed flow path as  
23 well as a separation reducing contour so as to permit lift generating  
24 attached flow conditions to form along such lee surfaces. Substantially  
25 rigid structural reinforcement is provided to prevent the hydrofoil from  
26 deforming significantly during use. Methods are disclosed for providing  
27 a hydrofoil with a substantially longitudinal recess or venting system  
28 located substantially along the center axis of the hydrofoil. The  
29 attacking surfaces of such a hydrofoil is provided with an anhedral  
30 contour that forms a substantially lengthwise channel with the recess or  
31 venting means located along the center axis of this lengthwise channel.

1 The anhedral contour directs water toward the center axis of the  
2 lengthwise channel, and the central recess or venting system permits  
3 water to flow through it toward the ice surfaces in order to reduce the  
4 occurrence of outward directed spanwise flow conditions along the  
5 attacking surfaces and encourage inward directed spanwise flow  
6 conditions to occur along the attacking surfaces. The central recess or  
7 venting system also permits the water flowing in an attached manner  
8 along the lee surfaces of the hydrofoil to merge with the water flowing  
9 from the attacking surfaces through the recess or venting system so that  
10 life is efficiently generated. Methods are disclosed for applying these  
11 lift generating and drag reducing methods to both non-flexible and  
12 flexible hydrofoil blades that are used in reciprocating propulsion  
13 strokes through a fluid medium. Methods are disclosed for permitting  
14 flexible hydrofoils to deform in a manner which permits such efficient  
15 flow conditions to form under significantly light reciprocating strokes  
16 while simultaneously providing sufficient structural reinforcement to  
17 enable such flow conditions to be maintained without experiencing  
18 undesirable forms of deformation. Also provided are methods for  
19 significantly controlling and reducing the build up of torsional stress  
20 forces within a flexible hydrofoil as it is encouraged to twist to a  
21 reduced angle of attack during use so that such a twisted form is  
22 created with significant improvements in efficiency, contour, and ease.

23 In contradistinction, however, the present invention teaches a  
24 hydrofoil system for lifting a boat out of water an amount sufficient to  
25 reduce drag while still allowing the boat to be powered by a  
26 conventional inboard-outboard drive. The hydrofoil system includes a  
27 front hydrofoil unit, a center hydrofoil unit, and a pair of rear  
28 hydrofoil units. The front hydrofoil unit includes a hydrofoil portion  
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2 hull at the substantial center thereof. Each rear hydrofoil unit  
3 includes a hydrofoil that dependingly extends equidistantly outwardly  
4 from a pair of stanchions thereof that depend from port and starboard  
5 trim tab units of the hull, respectively.

6 U.S. Patent No. 6,164,235 to Hoppe teaches the invention provides  
7 a hydrofoil equipment water craft comprising at least one hull member,  
8 terminating at a bow and a stern, a front hydrofoil member arranged in  
9 the zone of the bow of the hull, at least partially below the hull; and  
10 a rear hydrofoil member positioned to the rear of the longitudinal  
11 center of gravity (LCG) of the hull, the front hydrofoil member being at  
12 least partially offset transversely relative to the rear hydrofoil  
13 member so that the front hydrofoil or rear hydrofoil are at least  
14 partially disposed in separate longitudinal flow streams.

15 In contradistinction, however, the present invention teaches a  
16 hydrofoil system for lifting a boat out of water an amount sufficient to  
17 reduce drag while still allowing the boat to be powered by a  
18 conventional inboard-outboard drive. The hydrofoil system includes a  
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25 hull at the substantial center thereof. Each rear hydrofoil unit  
26 includes a hydrofoil that dependingly extends equidistantly outwardly  
27 from a pair of stanchions thereof that depend from port and starboard  
28 trim tab units of the hull, respectively.

29 U.S. Patent No. 6,354,237 B1 to Gaynor et al. teaches a trim tab  
30 control system is provided in which four buttons or switches are  
31 provided for the marine operator in which the operator can select to

1 raise the bow, raise the stern, raise the port side of the boat, or  
2 raise the stern side of the boat in relative terms, and the system will  
3 automatically position the trim tabs to most efficiently achieve the  
4 operator's demanded change in position of the marine vessel.

5 In contradistinction, however, the present invention teaches a  
6 hydrofoil system for lifting a boat out of water an amount sufficient to  
7 reduce drag while still allowing the boat to be powered by a  
8 conventional inboard-outboard drive. The hydrofoil system includes a  
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15 hull at the substantial center thereof. Each rear hydrofoil unit  
16 includes a hydrofoil that dependingly extends equidistantly outwardly  
17 from a pair of stanchions thereof that depend from port and starboard  
18 trim tab units of the hull, respectively.

19 Pursuant to 37 CFR Sec. 1.111(c), the present invention defines  
20 the following advantageous distinctive feature, inter alia that  
21 distinguishes over, and avoids, the prior art:

22 "A hydrofoil system for lifting a  
23 boat out of water an amount  
24 sufficient to reduce drag while  
25 still allowing the boat to be  
26 powered by a conventional inboard-  
27 outboard drive, wherein the boat has  
28 a hull with a bottom, a bow, a stern  
29 with port and starboard trim tabs,  
30 and a substantial center which is  
31 intermediate the bow of the hull and  
32 the stern of the hull, said system  
33 comprising: a front hydrofoil unit;  
34 a center hydrofoil unit; and a pair  
35 of rear hydrofoil units; wherein

1 said front hydrofoil unit is for  
2 depending from the bottom of the  
3 hull at the bow thereof; wherein  
4 said pair of rear hydrofoil units  
5 are for depending from the port and  
6 starboard trim tab units of the  
7 hull, respectively; and wherein said  
8 center hydrofoil unit is for  
9 depending from the bottom of the  
10 hull at the substantial center  
11 thereof. "

12 In evaluating the prior art one must bear in mind, inter alia, that the  
13 prior art must accomplish applicant's results, which was succulently  
14 expressed in the Board of Appeals decision in Ex parte Tanaka, Marushima  
15 and Takahashi, 174 USPQ at 38, where the Board held:

16 "Claims can not be  
17 rejected on the ground  
18 that it would be obvious  
19 to one of ordinary skill  
20 in the art to rewire  
21 prior art devices if it  
22 does not accomplish  
23 applicant's result."  
24 [Emphasis added]

25 And in In re Wright, 122 USPQ 522 (1959), where the Court held:

26 "...the mere aggregation  
27 of old elements that did  
28 not perform a different  
29 function is not a  
30 patentable invention,  
31 but that a novel  
32 combination of old  
33 elements which cooperate  
34 with each other to  
35 produce a new or useful  
36 result or a substantial  
37 increase in efficiency  
38 is patentable." [Emphasis  
39 added]

1 And further in the en banc decision in In re Dillon, 919 F.2d 688,  
2 692 (Fed. Cir. 1990), where the Court held:

3 "...a prima facie case  
4 of obviousness requires  
5 that the prior art  
6 suggest the claimed  
7 compositions' properties  
8 and the problem the  
9 applicant attempts to  
10 solve." [Emphasis added]

11 Further support for considering the results accomplished by the  
12 present invention discussed, supra, in determining patentability can be  
13 found in the decision in In re Echerd, 176 USPQ 321 (CCPA 1973), where the  
14 Court held:

15 "there is nothing  
16 inherently wrong in  
17 defining something by  
18 w h a t i t  
19 does..." [Emphasis added]

20 In this same regard, the Examiner's attention is directed to the  
21 decisions in In re Halleck, 164 USPQ 647 (CCPA 1970); and Kockum  
22 Industries, Inc. v. Salem Equipment, Inc., 175 USPQ 81 (9th Cir. 1972).

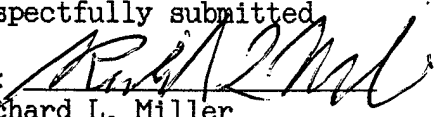
23 Petitioner has provided clear and convincing evidence arguendo that  
24 the prior art does not accomplish applicant's result of providing an  
25 efficient hydrofoil system for lifting a boat out of water an amount  
26 sufficient to reduce drag while still allowing the boat to be powered by  
27 a conventional inboard-outboard drive. The hydrofoil system includes a  
28 front hydrofoil unit, a center hydrofoil unit, and a pair of rear  
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33 a pair of stanchions thereof that depend from the bottom of the hull at  
34 the substantial center thereof. Each rear hydrofoil unit includes a

1 hydrofoil that dependingly extends equidistantly outwardly from a pair of  
2 stanchions thereof that depend from port and starboard trim tab units of  
3 the hull, respectively.

4 It is believed that the above disclosed PETITION TO MAKE SPECIAL is  
5 in compliance with all sections of MPEP 708.02(VIII) and it is accordingly  
6 respectfully requested that the above-identified application be made  
7 special and that it be acted upon before all non-special cases.

8  
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Date: March 2, 2004